

# Coaxial SPDT RF Switch

# ZFSWA2-63DR+ ZFSWA2R-63DR+

50Ω 500-6000 MHz

## The Big Deal

- Wide bandwidth 500 to 6000 MHz
- Very high isolation, 65 dB at 1GHz
- Very fast switching, 35ns



CASE STYLE: ZZ1322

## Product Overview

The ZFSWA2-63DR+ / ZFSWA2R-63DR+ is a great general purpose SPDT solid state absorptive RF switch. With its broad frequency range, fast 35 ns switching time and excellent RF performance, the ZFSWA2-63DR+ / ZFSWA2R-63DR+ is an excellent choice for many applications. In addition to its versatility within system block diagrams, the ZFSWA2-63DR+ / ZFSWA2R-63DR+ is designed for easy integration into your prototype design applications. ZFSWA2-63DR+ is the standard configuration. ZFSWA2R-63DR+ is the mirrored configuration with RF1 and RF2 ports interchanged.

## Key Features

| Feature  | Advantages  |
|--|---|
| Designed for any environment   | The ZFSWA2-63DR+ / ZFSWA2R-63DR+ is equipped with MMIC internal device with a wide operating temperature range (-55°C to 100°C). Suitable for many environments and applications the ZFSWA2-63DR+ / ZFSWA2R-63DR+ offers excellent performance and value. |
| Integrated CMOS Driver   | -Operates from 3-5V<br>-Low control current 5 μA allows compatibility with a variety of driver circuits<br>-Internal Decoupling<br>-Fast 35 ns Switching time   |
| Excellent for a Variety of Applications From Bench to Integrated Systems | -High speed testers<br>-Automated switching networks<br>-Wireless Infrastructure<br>-Military   |
| Excellent RF Performance   | -Wide bandwidth: 500 to 6000 MHz<br>-Low Insertion Loss: 1.4 dB Typ<br>-High Isolation: 65 dB Typ @ 1 GHz   |

### Notes

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# Coaxial SPDT RF Switch

50Ω 500-6000 MHz

Absorptive RF Switch with Internal Driver  
Single Supply Voltage, +3V to +5V

## Product Features

- Wide bandwidth, 500 to 6000 MHz
- High Isolation, 65 dB typ. at 1 GHz
- Low Insertion loss, 1.4 dB typ.
- Internal CMOS driver
- Fast switching, Rise/fall time, 25 ns typ.
- Wide operating temperature, -55°C to 100°C

## Typical Applications

- Cellular
- ISM, WCDMA, WIMAX
- PCN
- Automated switching networks
- Military



Generic photo used for illustration purposes only

## ZFSWA2-63DR+ ZFSWA2R-63DR+

CASE STYLE: ZZ1322

| Connectors                  | Model         |                     |
|-----------------------------|---------------|---------------------|
| SMA                         | ZFSWA2-63DR+  | (Standard option)   |
| SMA                         | ZFSWA2R-63DR+ | (RF Ports Reversed) |
| <b>BRACKET (OPTION "B")</b> |               |                     |

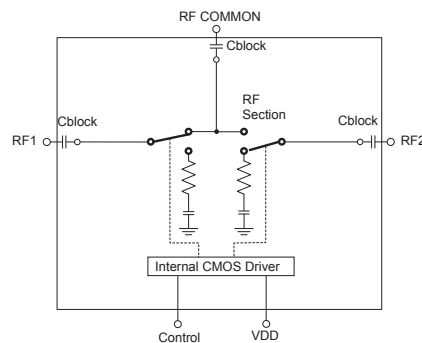
### +RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

## General Description

The ZFSWA2-63DR+ / ZFSWA2R-63DR+ is a 50Ω high isolation, absorptive SPDT RF switch designed for wireless applications, covering a broad frequency range from 500 to 6000 MHz with low insertion loss. The ZFSWA2-63DR+ / ZFSWA2R-63DR+ operates on a single supply voltage in the range of +3V to +5V. This unit includes an internal CMOS driver. The ZFSWA2-63DR+ / ZFSWA2R-63DR+ switch comes with a internal MMIC device for tough environments. ZFSWA2-63DR+ is the standard configuration. ZFSWA2R-63DR+ is the mirrored configuration with RF1 and RF2 ports interchanged.

## Schematic and Application Circuit



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**RF Electrical Specifications, 500 - 6000 MHz, T<sub>AMB</sub>=25°C, V<sub>DD</sub>= +3V to +5V**

| Parameter                                       | Condition                            | Min. | Typ. | Max. | Units |
|---|--------------------------------------|------|------|------|-------|
| Frequency Range                                 |                                      | 500  |      | 6000 | MHz   |
| Insertion Loss                                  | 500 MHz                              |      | 1.0  | 1.3  | dB    |
|   | 1000 MHz                             |      | 1.15 | 1.5  |       |
|   | 2000 MHz                             |      | 1.4  | 1.7  |       |
|   | 4000 MHz                             |      | 1.7  | 2.1  |       |
|   | 6000 MHz                             |      | 2.0  | 2.6  |       |
| Isolation between Common port and RF1/RF2 Ports | 500 to 2000 MHz                      | 50   | 65   |      | dB    |
|   | 2000 to 4000 MHz                     | 48   | 57   |      |       |
|   | 4000 to 6000 MHz                     | 35   | 45   |      |       |
| Isolation between RF1 and RF2 ports             | 500 to 2000 MHz                      | 50   | 60   |      | dB    |
|   | 2000 to 4000 MHz                     | 43   | 50   |      |       |
|   | 4000 to 6000 MHz                     | 35   | 45   |      |       |
| Return Loss (ON STATE)                          | 500 to 2000 MHz                      |      | 20   |      | dB    |
|   | 2000 to 4000 MHz                     |      | 17   |      |       |
|   | 4000 to 6000 MHz                     |      | 15   |      |       |
| Return Loss @ RF1/RF2 ports (OFF STATE)         | 500 to 2000 MHz                      |      | 17   |      | dB    |
|   | 2000 to 4000 MHz                     |      | 19   |      |       |
|   | 4000 to 6000 MHz                     |      | 16   |      |       |
| Input IP3                                       | V <sub>DD</sub> =3V, 500 to 2000 MHz |      | 47   |      | dBm   |
|   | 2000 to 6000 MHz                     |      | 40   |      |       |
|   | V <sub>DD</sub> =5V, 500 to 2000 MHz |      | 49   |      |       |
|   | 2000 to 6000 MHz                     |      | 44   |      |       |
| Input 1dB Compression <sup>(1)</sup>            | V <sub>DD</sub> =3V, 500 to 2000 MHz |      | 24   |      | dBm   |
|   | 2000 to 6000 MHz                     |      | 24   |      |       |
|   | V <sub>DD</sub> =5V, 500 to 2000 MHz |      | 30   |      |       |
|   | 2000 to 6000 MHz                     |      | 27   |      |       |

**DC Electrical Specifications**

|                                     |                     |                    |    |                 |    |
|-------------------------------------|---------------------|--------------------|----|-----------------|----|
| VDD, Supply Voltage                 |                     | 3                  |    | 5               | V  |
| Supply Current <sup>(2)</sup>       | V <sub>DD</sub> =5V |                    | 50 |                 | μA |
| Control Voltage Low                 |                     | 0                  |    | 0.5             | V  |
| Control Voltage High <sup>(3)</sup> |                     | 2.7 <sup>(4)</sup> |    | V <sub>DD</sub> | V  |
| Control Current                     |                     |                    | 5  |                 | μA |

**Switching Specifications**

|  |                     |  |    |  |                   |
|--|---------------------|--|----|--|-------------------|
| Rise/Fall Time (10 to 90% or 90 to 10% RF)         | V <sub>DD</sub> =5V |  | 25 |  | nSec              |
| Switching Time (50% CTRL to 90/10% RF)             | V <sub>DD</sub> =5V |  | 35 |  | nSec              |
| Video Feed through (Control 0-5V, Frequency 1 MHz) | V <sub>DD</sub> =5V |  | 30 |  | mV <sub>P-P</sub> |

Notes:

- Note absolute maximum rating for input and dissipated power. At 5V, over 2000-6000 MHz, 0.2 dB compression.
- Increases with switching repetition rate. See graph.
- CMOS interface latch-up condition may occur when logic high signal is applied prior to power supply.
- 3.5V for V<sub>DD</sub>=4 to 5V

**Absolute Maximum Ratings**

| Parameter                        | Ratings                                   |
|----------------------------------|---|
| Operating Temperature            | -55°C to 100°C                            |
| Storage Temperature              | -55°C to 100°C                            |
| V <sub>DD</sub> , Supply Voltage | 2.7 to 5.5V                               |
| Voltage Control                  | -0.2V Min. V <sub>DD</sub> Max.           |
| RF input power                   | 1Watt                                     |
| Dissipated Power at 25°C         | 370mW                                     |
| ESD, HBM                         | Class 1A (250 to <500V) per JESD22-A114   |
| ESD, MM                          | Class A (passes 50V) per JESD22-A115      |
| ESD, CDM                         | Class III (500 to <1000V) per JESD22-C101 |

Notes

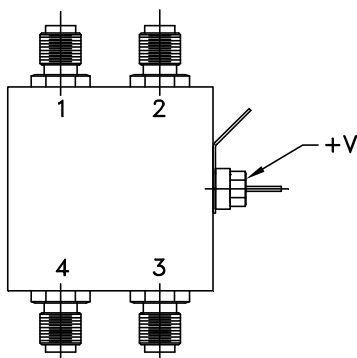
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**Truth Table** (State of control voltage selects the desired switch state)

| State of Control Voltage                             | Switch State - RF Common to |     |
|--|-----------------------------|-----|
|  | RF1                         | RF2 |
| Low  | ON                          | OFF |
| High   | OFF                         | ON  |
| ON- low insertion loss state<br>OFF- Isolation State |                             |     |

**Coaxial Configuration**



**Coaxial Connections**

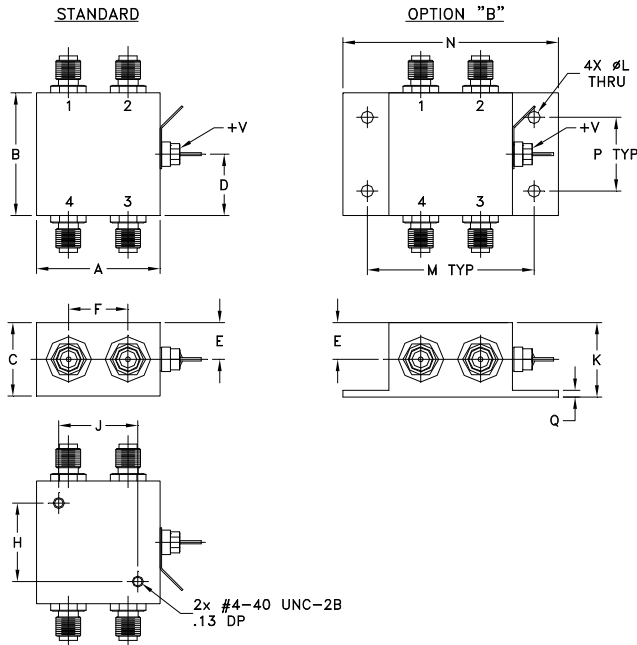
| Function | ZFSWA2R-63DR+ | ZFSWA2-63DR+ | Description          |
|----------|---------------|--------------|----------------------|
|          | Port Number   | Port Number  |                      |
| RF COM   | 1             | 1            | RF Common/ SUM Port  |
| RF1      | 3             | 4            | RF Out #1/In Port #1 |
| RF2      | 4             | 3            | RF Out #2/In Port #2 |
| Control  | 2             | 2            | CMOS Control IN      |
| VDD      | V+            | V+           | Supply Voltage       |
| GND      | Case          | Case         | RF Ground            |

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Outline Drawing (ZZ1322)



Outline Dimensions (inch / mm)

| A     | B     | C     | D     | E    | F     | G  | H     | J     | K     | L     | M     | N     | P     | Q    | wt    |
|-------|-------|-------|-------|------|-------|----|-------|-------|-------|-------|-------|-------|-------|------|-------|
| 1.25  | 1.25  | 0.75  | 0.63  | 0.38 | 0.6   | -- | 0.800 | 0.800 | 0.76  | 0.125 | 1.688 | 2.18  | 0.75  | 0.07 | grams |
| 31.75 | 31.75 | 19.05 | 16.00 | 9.65 | 15.24 | -- | 20.32 | 20.32 | 19.30 | 3.18  | 42.88 | 55.37 | 19.05 | 1.78 | 85    |

Additional Detailed Technical Information

Additional information is available on our web site. To access this information enter the model number on our web site home page.

Performance data, graphs

Case Style: ZZ1322

Environmental Ratings: ENV28

Pricing & Availability Information

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